



**Martian Moons eXploration Neutron and
Gamma-Ray Spectrometer SALMON-3 AO PEA I
Technical, Management and Cost Evaluation
Preproposal Teleconference/WebEx**

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Introduction

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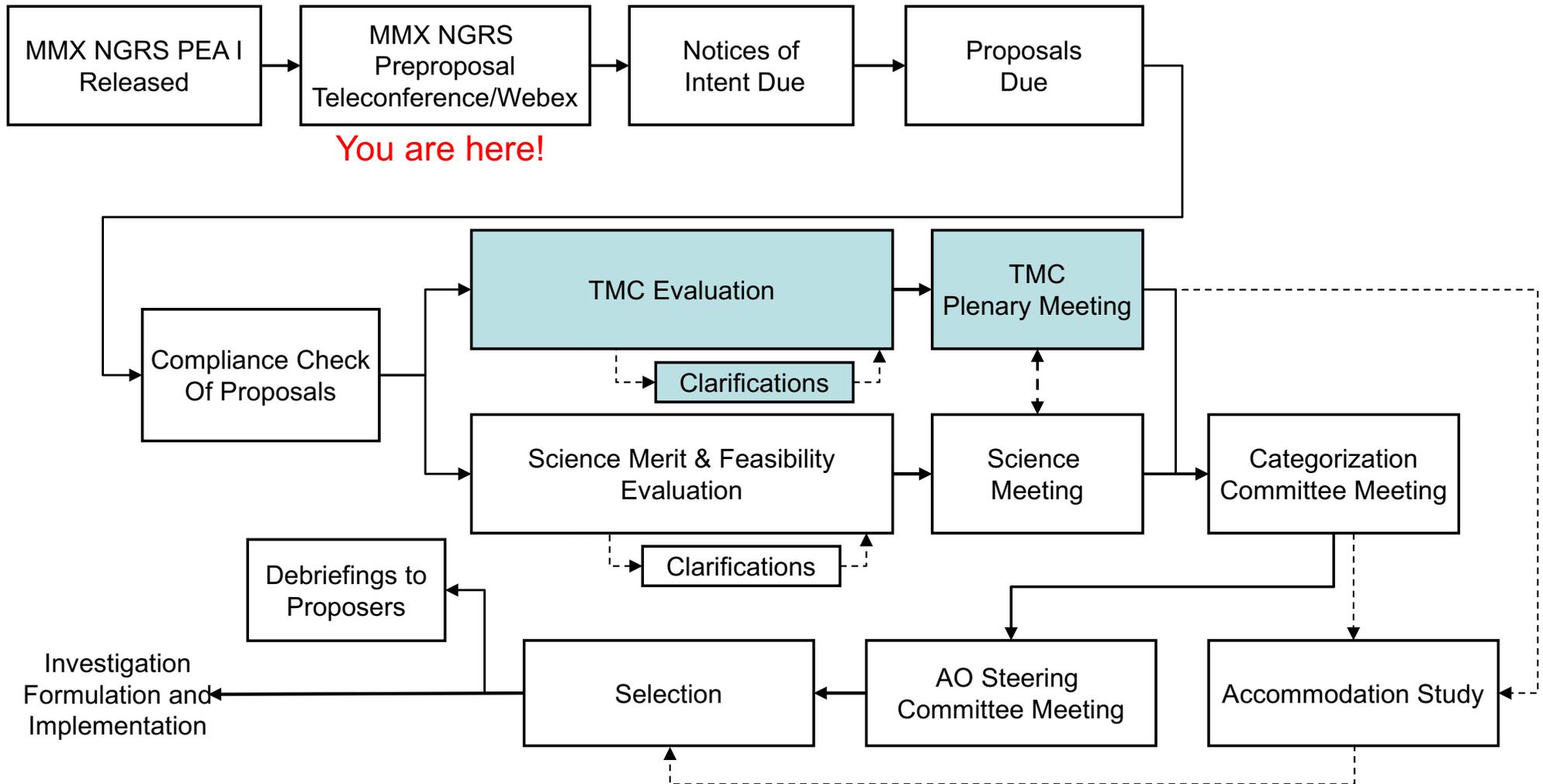
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1. Present a short overview of the Technical, Management and Cost (TMC) Evaluation of proposals submitted as a result of the Martian Moons eXploration (MMX) Neutron and Gamma-Ray Spectrometer (NGRS) Program Element Appendix (PEA) I of the Third Stand Alone Missions of Opportunity Notice (SALMON-3) Announcement of Opportunity (AO).
 2. Point to references
 3. Answer questions

Important Note: This PEA is to the SALMON-3 AO. All proposers must read this PEA & the SALMON-3 AO carefully, and all proposals must comply with the requirements and constraints contained within the two documents.



Introduction

MMX NGRS PEA I Solicitation, Evaluation and Selection Flow





Introduction

Evaluation Criteria and Selection Factors

Evaluation Criteria from Section 7.2 of the SALMON-3 AO:

1. Intrinsic Science, Exploration, or Technology Merit of the Proposed Investigation (Evaluated by the Science Panel);
2. Experiment Science, Exploration, or Technology Implementation Merit and Feasibility of the Proposed Investigation (Evaluated by the Science Panel);
3. **TMC Feasibility of the Proposed Investigation Implementation (Evaluated by the TMC Panel).**

Weighting: the first criterion is weighted approximately 40%; the second and third criteria are weighted approximately 30% each.

Other Selection Factors from Section 7.3 of the SALMON-3 AO:

- Programmatic factors
 - PI-Managed Mission Cost
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TMC Evaluation

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TMC Panel Composition and Organization

The Acquisition Manager, who is a Civil Servant from the NASA Science Office for Mission Assessments (SOMA) at NASA Langley Research Center (LaRC), leads the TMC panel. NASA SOMA works directly for NASA Headquarters and is firewalled from the rest of NASA LaRC.

TMC Panel evaluators are a mix of the best non-conflicted contractors, consultants, and Civil Servants who are experts in their respective fields.

- Evaluators read their assigned proposals.
- Evaluators provide findings on their assigned proposals.
- Evaluators provide ratings of proposals that reflect the findings.

Specialist evaluators may be called upon when technical expertise is needed that is not represented in the panel.

- Specialist evaluators evaluate only those parts of a proposal that are specific to their particular expertise.
 - Specialist evaluators provide only findings; they do not provide ratings.
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Principles for Evaluation

- All proposals are to be treated fairly and equally.
- Merit is to be assessed on the basis of material in the proposal and clarification process (if applicable).
- Evaluation Ratings reflect the written strengths and weaknesses.
- Everyone involved in the evaluation process is expected to act in an unbiased objective manner; advocacy for particular proposals is not appropriate.

General Evaluation Ground Rules

- All proposals are evaluated to uniform standards established in the solicitation, and without comparison to other proposals.
- All evaluators are experts in the areas that they evaluate.
- Specialist evaluators (to provide special technical expertise to the TMC Panel) may be utilized based on need for technology/engineering area that is proposed. Specialist evaluators do not provide ratings.



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TMC Panel Evaluation Factors

Factors C1 – C5: TMC Feasibility of the Proposed Investigation Implementation: Please refer to Section 7.2.4 of the SALMON-3 AO for details. These factors are evaluated as applicable for each proposed investigation.

- Factor C-1. Adequacy and robustness of the instrument implementation plan.
- Factor C-2. Adequacy and robustness of the investigation design and plan for operations.
- Factor C-3. Adequacy and robustness of the flight systems.
- Factor C-4. Adequacy and robustness of the management approach and schedule, including the capability of the management team.
- Factor C-5. Adequacy and robustness of the cost plan, including cost feasibility and cost risk.



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TMC Panel Evaluation Findings Definitions

- **Major Strength:** A facet of the implementation response that is judged to be well above expectations and can substantially contribute to the ability of the project to meet its technical requirements on schedule and within cost.
- **Minor Strength:** A strength that is worthy of note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of risk.
- **Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its technical objectives on schedule and within cost.
- **Minor Weakness:** A weakness that is sufficiently worrisome to note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of risk.

Note: Findings that are considered “as expected” are not documented in the Form C.



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TMC Cost Analysis

- Initial cost analyses is accomplished on the basis of information provided in the proposals (consistency, completeness, proposed basis of estimate, contributions, use full cost accounting, maintenance of reserve levels, cost management, etc.).
- Cost is assessed with one or more models.
- Cost threats, risks, and risk mitigations are analyzed.
- The entire panel participates in Cost deliberations. All information from the entire evaluation process is considered in the final cost assessment.
- Cost realism (a.k.a. “cost risk”) is based on models, analogies, heritage, and grass roots information from proposals. Cost Realism is reported as an adjectival rating, ranging from “LOW Risk” to “HIGH Risk” on a five-point scale.
- Significant findings are documented in the Cost Factor on Form C and considered in the TMC Risk Rating.



TMC Evaluation

Cost Analysis: Cost Threat Matrix

- The *likelihood* and *cost impact*, if any, of each weakness is stated as “This finding represents a cost threat assessed to have an Unlikely/Possible/Likely/Very Likely/Almost Certain likelihood of a Minimal/Limited/Moderate/Significant/Very Significant cost impact being realized during development and/or operations.”
 - The *likelihood* is the probability range that the *cost impact* will materialize.
 - The *cost impact* is the best estimate of the range of costs to mitigate the threat.
- The cost threat matrix, below, is populated by the cost estimator with dollar amounts of the expected cost impact down to a lower limit of \$1M.

		Cost Impact (CI, % of PI-Managed Mission Cost to complete Phases A/B/C/D or % of Phase E not including unencumbered cost reserves)				
		Minimal (2.5% < CI ≤ 5%)	Limited (5% < CI ≤ 10%)	Moderate (10% < CI ≤ 15%)	Significant (15% < CI ≤ 20%)	Very Significant (CI > 20%)
Likelihood (L, %)	Almost Certain (L > 80%)					
	Very Likely (60% < L ≤ 80%)					
	Likely (40% < L ≤ 60%)					
	Possible (20% < L ≤ 40%)					
	Unlikely (L ≤ 20%)					



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Potential Major Weaknesses Clarification Process

NASA is requesting clarifications of Potential Major Weaknesses (PMWs) identified by the evaluation panels in all three criteria; Intrinsic Science Merit of the Proposed Investigation, Experiment Science Implementation Merit and Feasibility of the Proposed Investigation, and TMC Feasibility of the Proposed Investigation Implementation.

- NASA requests such clarification uniformly, from all proposers.
- All requests for clarification from NASA and the proposers' responses are in writing.
- The ability of proposers to provide clarification to NASA is extremely limited, as NASA does not intend to enter into discussions with proposers.
- PIs whose proposals have no PMWs are informed that no PMWs have been identified at that time.
- The form of the clarifications is strictly limited to a few types of responses:
 - Identification of the locations in the proposal (page(s), section(s), line(s)) where the PMW is addressed.
 - Noting that the PMW is not addressed in the proposal.
 - Stating that the PMW is invalidated by information that is common knowledge and is therefore not included in the proposal.
 - Stating that the analysis leading to the PMW is incorrect and identifying a place in the proposal where data supporting a correct analysis may be found.
 - Stating that a typographical error appears in the proposal and that the correct data is available elsewhere inside or outside of the proposal.

The PIs are given at least 24 hours to respond to the request for PMW clarification. Any response that goes beyond the five forms of clarification stated above will be deleted and not shown to the evaluation panel.



TMC Evaluation

TMC Risk Ratings

Based on the narrative findings, each proposal is assigned one of three risk ratings, defined as follows:

- **LOW Risk:** There are no problems evident in the proposal that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the proposer's capability to accomplish the investigation well within the available resources.
- **MEDIUM Risk:** Problems have been identified, but are considered within the proposal team's capabilities to correct within available resources with good management and application of effective engineering resources. Investigation design may be complex and resources tight.
- **HIGH Risk:** One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources.

Note: Only Major Findings are considered in the risk rating.



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TMC Panel Product: Form C

For each proposal, the TMC evaluation results in a Form C that contains:

- Proposal title, PI name, and submitting organization;
- An adjectival risk rating of “LOW Risk”, “MEDIUM Risk” or “HIGH Risk” for the TMC Feasibility of the Proposed Investigation Implementation, that is based on the findings;
- Summary rationale for the risk rating;
- Narrative findings, identified as major or minor strengths or weaknesses;
- Comments to the PI, Comments to the Selection Official, Comments to the Science Panel. (optional)



Classification



Categorization

Categorization Process and Proposal Categories

Upon completion of the evaluations, the results are presented to the Categorization Committee, composed wholly of Civil Servants and Intergovernmental Personnel Act appointees (some of whom may be from Government agencies other than NASA) and appointed by the Associate Administrator(s) for the appropriate Mission Directorate(s).

The Categorization Committee considers the evaluation results and, based on the evaluations, categorize the proposals in accordance with procedures required by NFS 1872.403-1(e). The categories are defined as:

- Category I. Well-conceived and scientifically and technically sound investigations pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and data that can be properly reduced, analyzed, interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.



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Categorization Process and Proposal Categories

- Category II. Well-conceived and scientifically or technically sound investigations, which are recommended for acceptance, but at a lower priority than Category I.
- Category III. Scientifically or technically sound investigations, which require further development. Category III investigations may be funded for development and may be reconsidered at a later time for the same or other opportunities.
- Category IV. Proposed investigations that are recommended for rejection for the particular opportunity under consideration, whatever the reason.



References

Notices Regarding the MMX NGRS PEA

- Watch for notices on MMX NGRS Solicitation Page in NSPIRES

<https://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId={15A0737B-EA4B-6B41-CA28-C3DEBE6C719B}&path=open>

- Watch for notices at the MMX NGRS Acquisition Homepage

<https://soma.larc.nasa.gov/mmx>

- Check the MMX NGRS Library

<https://soma.larc.nasa.gov/mmx/programlibrary.html>

Example - *TRL Examples* document - Examples that provide possible scenarios where system level Technology Readiness Level (TRL) 6 is demonstrated. Proposing teams should address the requirement according to their investigation's unique system considerations, including stages of development.

- Check and review the Q&As often as new ones are added periodically

<https://soma.larc.nasa.gov/mmx/mmx-qas.html>



Questions

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Questions

All questions pertaining to the MMX NGRS MUST be addressed to:

Thomas Statler, PhD
MMX NGRS Program Scientist

Preferably by email at:

thomas.s.statler@nasa.gov

Subject line to read "MMX NGRS"

Or by mail at:

Science Mission Directorate
NASA Headquarters;
300 E Street SW
Washington, DC 20546-0001